

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS AND FIGURES OF THE  
MORPHOTYPES OF SOME CONIFER FEEDING  
APHIDS

BY F. C. HOTTES

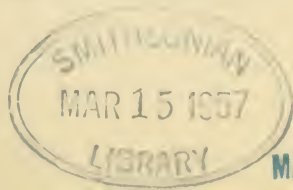
It is a pleasure to acknowledge the assistance of Dr. Louis G. Gentner and Mr. Joe Schuh who collected some of the forms described herewith.

*Cinara sonata* H.

*Alate viviparous female.*

Length from vertex to end of anal plate 6.60mm. Color in life not recorded, but cleared specimen is similar to cleared apterous viviparous forms. Length of antennal segments as follows: III 1.10mm., IV .50mm., V .50mm., VI .28 + .05mm. Sensoria distributed as follows: III 4-5 plus primary, confined to end of segment and arranged in a row, IV 1-2 secondary, plus primary, V 2 secondary, plus primary. Hair on third antennal segment fine, upstanding varying from .15-.18mm. in length, and quite numerous. Region of sixth antennal segment beyond middle weakly imbricated. One marginal sensorium much larger than the others and with a distinctly open center. Compound eyes very much rounded, comparatively small, with area next to head, equal to about half of eye free from ommatidia. Ocular tubercles present, but so small that they are apt to be overlooked. Rostrum not extended. Length of pro meso and metathoracic femora as follows: 2.20, 2.02, and 2.775mm. Length of metathoracic tibiae 5.40mm. Length of first metatarsal segment .12mm. Length of second tarsal segment .495mm. Wings poorly mounted, media very faint, twice branched, media 3 and 4 hardly visible. Cornicles with base much longer from the front to rear, than from side to side, longest width of base .90mm. Base of cornicles with numerous long rather coarse hairs, more constricted area of cornicles with finer, and somewhat shorter hair. Inner margin of cornicles with a deep cleft, similar to that which is present in the apterous viviparous female. Waxpore plates small, but the individual facets are very large. Pigmented areas are absent on the dorsum of the abdomen anterior to the cornicles, and almost lacking posterior to them, where present very small, very irregular and without arrangement. Pigmented spots anterior to cauda with from two to three rows of hairs. Other features of the alate similar to those of the apterous viviparous female.

Morphotype alate viviparous female deposited in the United States



National Museum. *Abies grandis*, Kootenai, Idaho July 18, 1949.  
Coll. A. L. Gibson.

This form differs from the alate form of *C. abieticola* (Chol.) in having the secondary sensoria confined to the end of the segment on the third segment, in longer antennal segments, in having the genital plate wider and different in shape, in the shape and size of the cornicles, and in having the long hairs on the sixth antennal segment more numerous, and covering a greater extent of the segment.

*Alate male.*

Length from vertex to end of anal plate 3.375mm. Width of head through the eyes .78mm. Length of antennal segments as follows: III .75mm., IV .36mm., V .33mm., VI .20 + .05mm. Secondary sensoria distributed as follows: III 55, covering most of segment, IV 12, confined for the most part to the posterior surface and irregularly arranged, V, 3 arranged in a row on the posterior surface. Primary sensoria if present on third and fourth segments, like secondary, primary sensorium on fifth antennal segment large and quite tuberculate. Hair on antennae about .18mm. in length, fine, upstanding, much more numerous on anterior margin than on posterior margin. Median transverse suture on head very narrow, and not much darker than the head. Eyes small, round, without ocular tubercles. Media of fore wings with two forks, the second fork closer to the margin of the wing, but far removed from the edge. All femora with fine long hairs, which are rather numerous. Metathoracic femora 1.42mm. in length. Metathoracic tibiae 2.40mm. in length. First metatarsal segment .135mm. long, second metatarsal segment .36mm. in length. Hairs on metathoracic tibiae longer on outer margin than on inner margin, on this surface some hairs are more upstanding than others, these hairs are as a rule longer than the hairs which are not so upstanding. Hairs on dorsum of abdomen more numerous and longer than the hairs on the ventral surface. Ventral surface of abdomen with a distinct pigmented spot anterior to the genital plate, and about the same in size. Pigment spots on the dorsum of the abdomen indistinct. Cornicles longer than wide, length about .375mm. Inner margin of cornicles with a distinct furrow, similar to that found in the apterous and alate viviparous females. Surface of cornicles with numerous fine, long hairs, except for the restricted area where the hairs are much shorter. Anterior to the cauda there are two pigmented spots, these are very narrow, with their more median portions more or less fragmented. Cauda and anal plate with numerous hairs. Harpes rather blunt with moderately long hairs over the apex surface.

Allotype alate male, deposited in the United States National Museum. Collected on *Abies magnifica* var. *shastensis*, Mt. Ashland, Oregon Sept. 27, 1956 by L. G. Gentner.

*Apterous oviparous female.*

Length from vertex to end of anal plate 4.27mm. distinctly smaller than the viviparous female. Color of mounted specimens similar to that of viviparous females. Length of antennal segments as follows: III .97mm., IV .375mm., V .435mm., VII .225 + .075mm. Length of hind tibiae 3.60mm. provided with numerous small, tuberculate sensoria which cover all of the surface except the extreme base and a short

space near the apex. The hind tibiae are hardly swollen. Other features similar to those found on apterous viviparous female. Morphotype apterous oviparous female, deposited in the United States National Museum. Collected at the same time, and on the same host as the male by L. G. Gentner.

This species is apparently quite common on *Abies* sp. in our North Western States. Specimens of this species are so large that it is common to have immature specimens taken for mature ones. Immature specimens of *C. sonata*, always have the cornicles, smaller, much rounded, and lack the furrow on the inner margin.

Dr. L. G. Gentner to whom I am indebted for the male and oviparous females described herewith has taken it several times in Southern Oregon. He has sent me the following color and habitat notes, which are the first such taken from life known to me.

"Taken by beating the lower branches of Shasta red fir, *Abies magnifica shastensis*. Specimens were observed on the under sides of the lower branchlets among the bases of the needles. Apterous forms rather broadly oval, piceous, with bronze aenescens, very dark gray, dull patches of waxy powder on the pronotum and several narrow, transverse bands of same on dorsum of abdomen; underside covered with somewhat lighter grayish powder; legs pale brownish with dark areas at the joints and towards the middle of the segments giving them a banded appearance, antennae pale brownish with a piceous blotch at each joint."

#### *Cinara setulosa* H & E

##### *Alate male.*

Length from vertex to end of anal plate approximately 2.155mm. Dr. L. G. Gentner who collected the material from which this form is described recorded the color as follows: "Head and thorax black. Abdomen rather bright green." Antennae dusky except for the extreme base of third segment which is pale. All femora dusky with area at extreme base yellowish. Pro and mesothoracic femora much darker than the metathoracic femora. Tibiae and tarsal segments very dark brownish black, uniform throughout.

Length of antennal segments as follows: III .60mm., IV .23mm., V .22mm., VI .18 + .04mm. Sensoria distributed as follows: III 53-70 as a rule more than 57, covering most of segment, IV 16 covering all sides of segment, V 3-4 arranged irregularly, V 0-2. All sensoria are tuberculate, and variable in size. Media of fore wings twice forked, the second fork closer to the margin of the wing. Length of metathoracic femora 1.15mm. Length of metathoracic tibiae 1.725mm. Hair on outer margin of methathoracic tibiae fine, upstanding, varying in length from .10-.15mm. On this margin the hairs which are shorter are less upstanding than the longer hairs. Hairs on the inner margin of the hind tibiae are shorter, more numerous, and less upstanding than the hairs on the outer margin.

Cornicles with base measuring about .18mm. not much wider than height. Cornicles provided with two lengths of hairs, the shorter out numbering the long, the long hairs are fine, distinctly not spine-like as are those of the females. Dorsum of abdomen without setulae, in sharp contrast to the condition present in the apterous females.

Hair on dorsum of abdomen long and fine, approximately .11mm. in length. Harpes with numerous hairs which are shorter than those on the cauda.

This form differs greatly from what one would expect, knowing the structure of the apterous viviparous females. The cornicles lack the distinctly spine-like hairs found on the cornicles of the females and the dorsum of the abdomen not only lacks hairs of this type, but is without setulae. The hairs on the outer margin of the tibiae are much longer and finer than one would expect.

#### *Oviparous female.*

Length from vertex to end of anal plate varying from 4.05-4.38mm. Dr. L. G. Gentner who collected this form together with apterous viviparous females has sent me the following information which probably applies to both forms, but since the viviparous females outnumbered the oviparous females, and since no mention is made of the presence of powder, which may be expected on oviparous females, the notes may apply only to viviparous females. "Deep green, with a broad, pale greenish yellow, median longitudinal band, bordered on each side by a narrow dark green line. Smaller apterous forms which may be oviparous somewhat paler, more greenish in color, with the median band not so much in evidence."

Length of antennal segments as follows: III .57mm., IV .215mm., V .215mm., VI .18 + .045mm. Third and fourth antennal segments without sensoria, fifth segment with only primary. Hairs on antennae almost spine-like, those on anterior margin longer than those on the posterior margin. Metathoracic femora varying from 1.50-1.68mm. in length. Metathoracic tibiae varying from 2.10-2.47mm. in length. Length of metathoracic tarsal segments .15mm. and .55mm. Metathoracic tibiae with numerous small, very tuberculate sensoria that cover all of the surface except for the extreme base and apical fourth. The hairs on the outer margin of the hind tibiae are distinctly spine-like, quite upstanding and measure .10-.12mm. in length. The hairs on the inner margin are less upstanding, shorter, and less spine-like, as well as paler in color, than those on the outer margin, they are also more numerous. The hairs on both margins increase slightly in length towards the apex, the outer may also become less upstanding.

Cornicles not sharply differentiated from rest of abdomen in color, like those of apterous viviparous female, in being rather flat and with similar hairs, of two types. Dorsum of abdomen with setulose surface. Other features similar to those of apterous viviparous female.

Allotype, alate male. Morphotype, apterous oviparous female. Both types deposited in the United States National Museum. Collected by L. G. Gentner. Mt. Ashland, Jackson Co., Oregon, September 27, 1956. Taken on the lower branches of Shasta fir, *Abies magnifica* var *shastensis*.

#### *Cinara chinookiana* H.

##### *Apterous male.*

*Length and general color.*—Length from vertex to end of anal plate varying from 2.13-2.40mm. Dr. Gentner who collected the material from which this form is described records the color as follows: "Head and appendages black, black markings on thorax, abdomen greenish."

Cleared specimens indicate the antennae as brownish-black with the basal third of third segment paler. The dorsum of the abdomen has four rows of small wax pore plates, just median to the cornicles, just lateral to the outer row of wax pore plates there is a row of small pigmented spots, these are in line with the wax pore plates and the spiracles, which lie within pigmented areas. Pigmented spots anterior to the cauda, small, very irregular, provided with long hairs similar to those on the dorsum of the abdomen. Anterior to these pigmented areas and extending anteriorly as far as the cornicles, some of the hairs on the dorsum of the abdomen originate within small pigmented areas, which vary in size and shape. Cornicles with outer margins very irregular, with the anterior posterior axis much longer than the width. Harpes dark brown.

*Head and thorax.*—Length of antennal segments as follows: III .38-.405mm., IV .165-.17mm., V .21-.22mm., VI .17-.195 + .03mm. Sensoria distributed as follows: III 22-28, small, tuberculate, confined largely to posterior surface of segment, primary sensorium small. IV nine-fourteen, similar to those on third segment in size and position, primary sensorium likewise small. V nine-ten, primary sensorium large. VI seven-ten, two or more sensoria often more or less combined. Hair on anterior margin of antennae more numerous and longer than the hair on the posterior margin, varying in length from .06-.12mm. Marginal sensoria far removed from primary. Length of metathoracic femora varying from .825-.90mm. Length of metathoracic tibiae varying from 1.20-1.27mm. Hairs on these segments quite similar to those on the femora and tibiae of the viviparous female. Length of metatarsal segments .105 and .30mm.

*Abdomen.*—Cornicles with two lengths of hairs, the longer much longer than the shorter. Harpes suggestive of a mitten in shape, the thumb of which is rather long and thin, covered with moderately long hairs. Cauda and anal plate with setulae, both with two lengths of hair.

*Oviparous female.*

Length from vertex to end of anal plate varying from 3.75-3.38mm. Dr. Gentner has sent me the following color notes, which most likely also apply to the apterous viviparous female, since both forms were included in the same vial, "Shining reddish-brown, with yellowish-brown appendages, head dark, cornicles black." Antennal segments with the following lengths: III .375-.395mm., IV .18mm., V .225mm., VI .18 + .03mm. Third antennal segment without sensoria, fourth as a rule without secondary sensoria, sometimes with one, primary sensorium present. Fifth antennal segment with one or two secondary sensoria, and large primary. Sixth antennal segment weakly imbricated. Metathoracic femora varying in length from 1.02-1.125mm. Metathoracic tibiae varying in length from 1.38-1.50mm. Hind tibiae with a moderate number of small tuberculate sensoria, which are not very distinct. Other features similar to those of apterous viviparous female.

Allotype, apterous male. Morphotype oviparous female. Both types deposited in the United States National Museum. Collected by Dr. Louis G. Gentner. Crater Lake, Oregon, October 2, 1956. Host, *Abies lasiocarpa*.

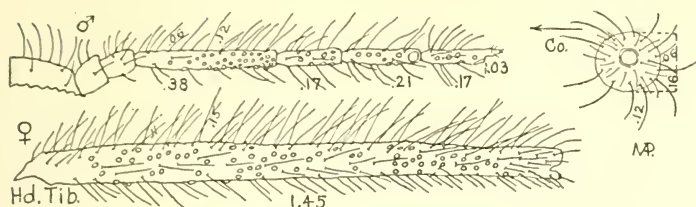
*Cinara rustica* H.*Alate viviparous female.*

Length from vertex to end of anal plate varying from 2.45-3.225mm. Color not closely observed, but dark dusky. Length of antennal segments as follows: III .42mm., IV .19mm., V .21mm., VI .10 + .03mm. Sensoria distributed as follows: III 2-4 plus primary, the secondary sensoria are arranged in a row, and show considerable variation in size. IV with only primary sensorium. V with one secondary and primary sensorium. All primary sensoria with wide rims. Hair on antennae sparse, upstanding, and about .07mm. in length. Third, fourth and fifth antennal segments pale with apical portions dusky. Ocular tubercles present and normal in size. Lateral lobes of thorax with hairs limited to the median portions of lobes. Media either once or twice forked. Posterior margin of stigma with a number of hairs. Stigma outlined with a fuscous border. Cornicles with outer margin quite regular. Width of cornicles .42mm. Metathoracic femora 1.05-1.20mm. in length, hairs fine upstanding, shorter than width of femora. Metathoracic tibiae 1.90-1.95mm. in length, hair similar to that of apterous viviparous female. Dorsal surface of abdomen with comparatively few hairs, ventral surface of abdomen with numerous hair. Ventral and dorsal surfaces of abdomen clothed with extremely fine, short, very closely spaced setulae. Pigmented spots anterior to the cauda widely separated, broad, provided with hairs along the posterior margin, the hairs being arranged in one to three rows. Cauda and anal plate clothed with numerous fine, short, dusky setulae. Hairs on cauda confined largely to the posterior margin.

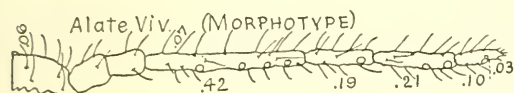
Specimens of this species feed on the needle free bark of more mature twigs of *Pinus edulis*. Morphotype, alate viviparous female, collected in type locality, deposited in the United States National Museum. Host, *Pinus edulis*. Springerville, Arizona, August 25, 1956.

*Schizolachnus curvispinosus* H. E. K.*Alate male.*

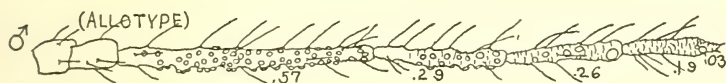
Length 2.13mm. Color of living specimen not recorded, mounted specimen dark brown, color most likely quite similar to that of females. Antennal segments with the following lengths: III .57mm., IV .29mm., V .26mm., VI .19 + .03mm. Sensoria on antennal segments as follows: III about 70, IV about 16, V about 8. Primary sensoria not distinctly different from secondary. Antennal hair not numerous, fine, sharp-pointed, slightly curved but not distinctly bent. Hair on femora fine, sharp-pointed curved. Hairs on tibiae only moderately coarse, curved but not distinctly bent, about .09mm. in length. Hairs on outer margin of metathoracic tibiae more upstanding and slightly longer than hairs on inner margin. All hairs on tibiae arising from distinct tubercles, making the tibiae look warty. It should be noted that the hairs on the antennae, femora and tibiae are distinctly unlike the hairs on similar parts of the females. Media simple. Hairs on dorsal surface of second tarsal segment coarser and longer than the hairs on the ventral surface. Length of metathoracic femora 1.05mm. Length of metathoracic tibiae 1.65mm. Length of metatarsal segments .075 and .30mm. Hairs on dorsum of abdomen finer, and longer than hairs on the females. Harpes with one posterior corner almost square, the other with a long finger.



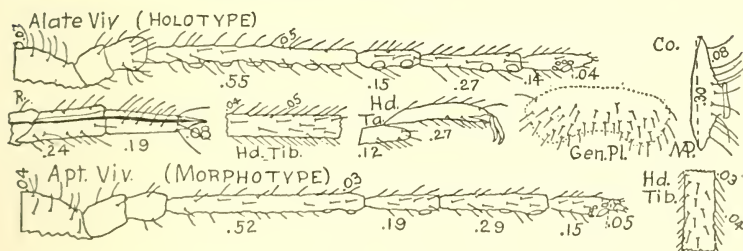
**CINARA chinookiana H.**



**Cinara rustica H.**



**Schizolachnus curvispinosus HEK**



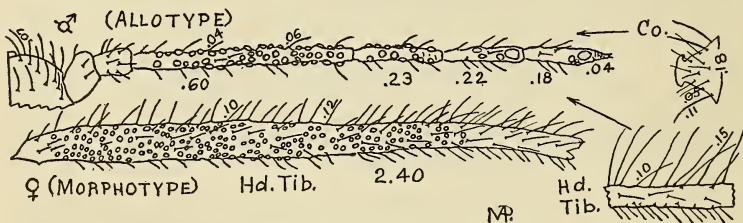
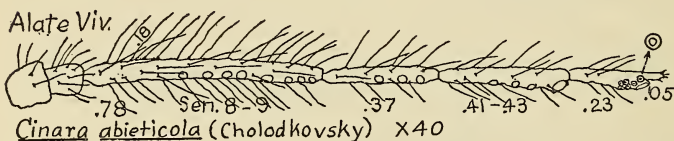
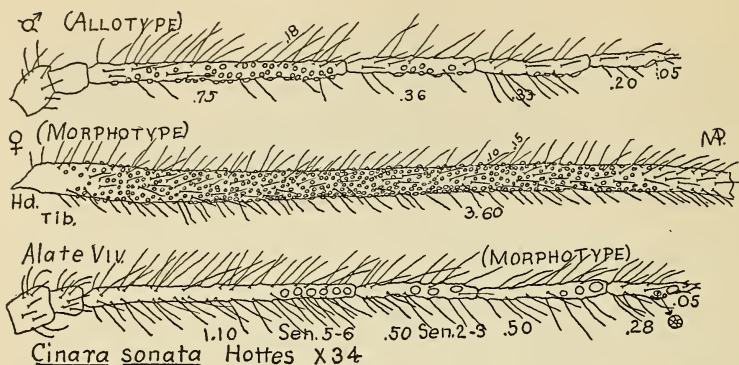
**CINARA curtihirsuta H&E**

Allotype, alate male, deposited in the United States National Museum. Butte Falls, Oregon, October 5, 1956. Coll. L. G. Gentner. Host, *Pinus ponderosa*.

**Cinara curtihirsuta H & E**

*Apterous viviparous female.*

Length from vertex to end of anal plate 3.67mm. Color not recorded from living specimens. As cleared and mounted yellowish-brown, with apical portions of third, fourth and fifth and all of sixth antennal segments dusky. Apical portions of femora distinctly darker than the base. Tibiae with distal portions dusky brown, the brown much more extensive on the metathoracic tibiae. Cornicles brown. Length of antennal segments as follows: III .52 mm., IV .19 mm., V .29mm., VI .15 + .05mm. One secondary sensorium either present or absent on third antennal segment, fourth antennal segment with one secondary



sensorium present. All other antennal segments with primary sensoria. Antennal hair not numerous, fine, sharp pointed, shorter than width of segment, varying in length from less than .03mm. to .03mm. Vertex of head with few hairs, which are similar to those on third antennal segment. Length of metathoracic femora 1.50mm. Length of metathoracic tibiae 2.70mm. Metatarsal segments .07 and .27mm. Hair on metathoracic tibiae varying in length from .03-.04mm. hair on the same segment of the alate viviparous female reaching a length of .05mm. but sometimes shorter. Mesosternal tubercle absent. Opening of cornicle distinctly acentric, much closer to posterior margin than to anterior margin. Hair on cornicles sparse, outer margin almost free from hairs. Transverse pigmented spots very narrow, with a row of coarse brown hairs along the posterior margin. Cauda and anal plate with setulae very well developed. Hairs on cauda confined largely to posterior surface. Morphotype, apterous viviparous female, deposited in the United States National Museum. Host, *Abies concolor*. Bly, Oregon Aug. 8, 1956 Coll. Joe Schuh.